

**MATERIALS FOR A MONOGRAPH  
OF FREYCINETIA GAUD.  
(PANDANACEAE)**

**XI. FREYCINETIA OF VIETNAM AND CAMBODIA  
AND THE IDENTITY OF *F. WEBBIANA* GAUD.**

by Benjamin C. STONE<sup>1</sup> and Harold St. JOHN<sup>2</sup>

**ABSTRACT.** — Two species of *Freycinetia* (*Pandanaceae*) have been identified from Vietnam and Cambodia, *F. Webbiana* Gaud. from Vietnam, and *F. sumatrana* Hemsl. from Cambodia and Vietnam. Although the genus was already known from this area, no species determinations had been made previously. The identity of *F. Webbiana* as Vietnamese at last solves the problem of this species, which has hitherto remained a mystery as to its place of origin.

**RESUMÉ :** *Freycinetia Webbiana* Gaudichaud, Voy. autour du monde... « La Bonite », d'origine inconnue et dont il n'y a pas de description ni de spécimen original, a été correctement illustré par GAUDICHAUD, *l. c.*, pl. 27, Atlas.

Le genre *Freycinetia* est cité par MARTELLI in Lecomte, Fl. Génér. Indochine sans indication d'aucune espèce.

Les auteurs trouvent deux spécimens d'Indochine, Vietnam, dont l'un (*Poilane 6466*) appartient à l'espèce de GAUDICHAUD et l'autre (*Pierre 6636*) à *F. sumatrana* Hemsl. D'après ces faits et les documents historiques du voyage de « La Bonite », *F. Webbiana* Gaud. a été récolté par son auteur en Indochine.

*F. sumatrana* a été également trouvé au Cambodge (*Pierre 6637*; *Schmid s.n.*) mais stériles.

Les espèces de *Freycinetia* sont distribuées dans la Malaisie, les Philippines, la Nouvelle Guinée et les îles du Pacifique; toutefois, deux espèces habitent l'Indochine.

**1. THE IDENTITY AND HOMELAND OF FREYCINETIA WEBBIANA**

Since its original publication in the Atlas of the Botany of the Voyage of "La Bonite" (1843), *Freycinetia Webbiana* Gaud. has been a mystery. No description of this species was ever published, but the name is valid under the International Code of Botanical Nomenclature, since a plate "with analyses" was published and since the generic name had already been substantiated by a valid publication by GAUDICHAUD in 1824. The illustration (Plate 27, Bot. Voy. Bonite) is very clear and detailed.

1. School of Biological Sciences, University of Malaya, Kuala Lumpur, Malaysia.  
2. B. P. Bishop Museum, Honolulu, Hawaii, U.S.A.

showing a pistillate plant in fruit, with enlarged views of two berries and of several seeds. This plate is reproduced as our Pl. 1.

In this paper we present evidence which, we believe, demonstrates that *Freycinetia Webbiana* Gaud. is a native of Vietnam.

#### HISTORY OF THE NAME

After the publication of the plate in 1848, there are only two further references to *Freycinetia Webbiana*. In 1900, WARBURG monographed the *Pandanaceae* for ENGLER's *Pflanzenreich*, 3 Heft. (IV.9), and described *F. Webbiana* on p. 37; his description is based solely on the original illustration and is quoted below. He stated: "Vaterland unbekannt. Man kennt nur die Abbildung". In 1910, MARTELLI listed the species in his catalog of binomials (*Webbia* 3: 315) stating only "patria ignota".

#### IDENTIFICATION

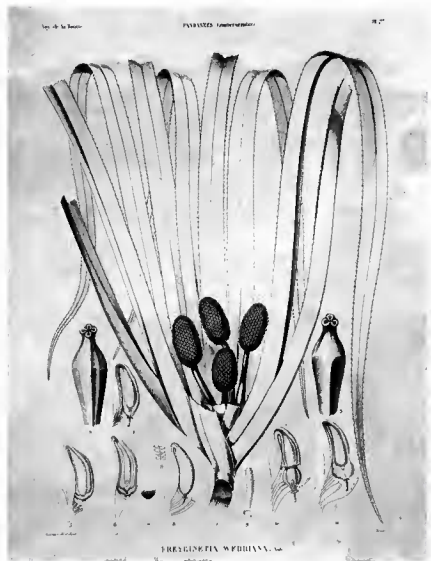
Our concern with the Indo-Chinese *Freycinetia* goes back to 1964. At that time Dr. H. ST. JOHN was in Paris, working in the herbarium of the Muséum d'Histoire Naturelle, he located a pistillate flowering specimen of the genus collected in Annam, now Vietnam, by E. POILANE in 1923, which had long been left undetermined. At that time any relationship to GAUDICHAUD's species had not yet been considered, and we supposed it to represent an undescribed species. The name remained in manuscript, unpublished, pending a closer examination of the POILANE specimen by B. C. STONE, in connection with studies leading to a generic monograph. In February 1969 this specimen was loaned to the University of Malaya Herbarium, where comparisons were made with all potentially similar species. At this time it was noticed that the specimen bore a strong resemblance to the illustration showing *F. Webbiana*. Extended careful comparison revealed that this resemblance extended to all significant features available: stigmatic number, leaf size and shape, marginal prickles, and peduncular epidermis. Since the POILANE specimen bears young pistillate heads in flowering stage a comparison of fruits was impossible. However, the similarity is so marked that we have no hesitation in assigning the POILANE specimen to *F. Webbiana* thereby disclosing for the first time that this species is a native of Vietnam.

#### *Freycinetia Webbiana* Gaudichaud

Bot. Voy. Bonite, Atlas, pl. 27 (1843); WARBURG, *Pandanaceae*, *Pflanzenr.* 3, IV. 9: 37 (1900); MARTELLI, in *Webbia* 3: 315 (1910).

HOLOTYPE: in the absence of an authentic specimen, the holotype must be the original illustration, Pl. 27, our Pl. 1.

Loc.: Vietnam (based on *Poilane 6466*, described below).



PL. 1. — *Freycinetia Webbiana* Gaud. Reduced from Pl. 27, Atlas, Botanique, Voy. de la France (Boulle) (1843). Holotype (in absence of herbarium specimen); 1, fructiferous branch; 2, 3, syncarp with 2 and 3 stigmas; 4, ovule with papillae of the conductive tissue, the nucellus apex as a very slender tube; 5, 6, ovules which nucellus and embryo sac are seen through the membranous and transparent teguments; 7, nucellus apex; 8, ovule; 9, 9', filament's apex of the conductive tissue; 10, 11 ovules. After d'ALLEIZETTE, Expl. descr. pl. Atlas, GAUDICHAUD, 1866.

**DIAGNOSIS** (ex Warburg) : « Folia ca. 50 cm longa 1/2 cm lata basi vaginantia apice sensim et longe acuminata\* in margine toto et costa in apice subtus denticulata\*. Inflorescentia ♀ terminalis, spadices ellipsoidei 3 cm longi 1/2 cm lati ex ic., quaterni pedunculis 2-5 cm longis 4 mm latis suffulti, ovaria angulate lageniformia apice collo conoideo instructa, stigmata 3-4 ».

This diagnosis should be modified to indicate that the leaves have a brief segment of their margins unarmed near the midregion.

**NEW AND EXPANDED DESCRIPTION** (based on *Poilane 6466*).

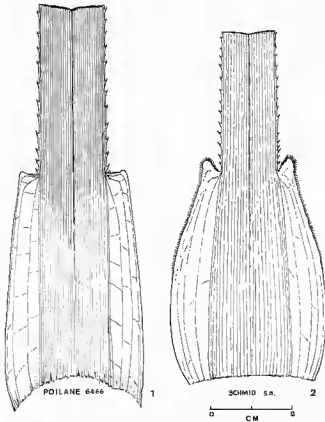
Woody vine climbing to 3 m on tress or trailing on rocks. Stems, 8-10 mm in diam. at apex, becoming 16-17 mm diam. in age; bark smooth, shining, fawn-colored or pale brown; leaf-scars annular, 5-22 mm apart; adventitious roots 1-4 mm diam., brown, pliant, strong. Leaves 50-63 cm long, 15-24 mm wide, thinly subcoriaceous, above dark green, beneath pale somewhat shiny green, with 15-20 parallel longitudinal secondary veins in each half near the midregion, the tertiary cross-veins somewhat visible beneath *in sicco*, mostly oblique forming narrowly elongate rhombic meshes. Leaf-base sheathing, unarmed, pale; blade ligulate, the outermost fifth narrowed into a trigonous rather stout subulate apex 1-3 cm long. Auricles 7-9 cm long, 7-15 mm wide, slightly narrowed toward apex and there concavo-truncate, the margins entire, the apex with 1-4 teeth in the truncation, texture membranous, with a few widely spaced longitudinal veins. Margins of blade prickly near base and near apex, with a brief segment from about halfway to two-thirds of the way to the apex unarmed; prickles near base (just above auricle apex) antrorse, obliquely deltoid, pale, brown-tipped, 0.3-0.8 mm long, 3-6 mm apart; prickles near apex smaller and somewhat more crowded, 0.2-0.3 mm long, 2-8 mm apart, otherwise similar. Midrib armed toward apex beneath with prickles 0.5-1 mm long, antrorse.

Pistillate inflorescence (near anthesis) of 4 pedunculate ellipsoid spadices each about 2 cm long, borne on smooth subterete peduncles 15-18 mm long (but probably not fully elongated), and 3-6 mm thick. Floral bracts white to « old-ivory »-colored (*vide Poilane*), the upper ones 75-115 mm long, 30 mm wide, broadly lanceolate, thickly chartaceous, with the base white, 35-45 mm long, and the apex subulate, green, 40-70 mm long, margins and midrib beneath with prickles; innermost bracts much shorter, deltoid, navicular, probably all white, unarmed. Ovaries flat-topped, glossy-brown at apex, with 3 or 4 (or very rarely 2) stigmas, these black, sunken, confluent, less than 0.4 mm wide.

**SPECIMEN EXAMINED** : Vietnam : nord de Ninh-Hoa, pr. Nhatrang, versant sud-est du massif de la Mère et l'Enfant; sorte de grand roseau grimpant, de 3 m de haut; il rampe aussi sur les roches en émettant des tiges secondaires et des racines adventives, dans les roches, forêt, 1 300 m alt., 17 mai 1923. *E. Poilane 6466 (P!)*.

(\*) Sic! **WARBURG** ought to have used the ending in-o.

NOTES : As will be noted from a comparison of the diagnosis and the expanded description, correspondence in most features is very good indeed. The absence of auricles in GAUDICHAUD'S Plate 27 is because they are deciduous; this is also true of the older leaves of *Poilane 6466*,



PL. 2. — Leaf-base with auricles : 1, *Freycinetia Webbiana* Gaud. (*Poilane 6466*, Vietnam); 2, *Freycinetia sumatrana* Hemsl. (*Schmid s.n.*, Cambodia).

and of most species of *Freycinetia* in general. The artist has indicated the leaf-bases with a rough line, precisely as they appear subsequent to shedding of their auricles. The very detailed figures of seeds cannot, unfortunately, either be compared or verified.

Indirect supporting evidence for a Vietnamese origin of *Freycinetia Webbiana* comes from the facts of Gaudichaud's itinerary on the ship "La Bonite". This vessel circumnavigated the globe in 1836-37, and is known to have visited Indo-China\*, as demonstrated by still extant

(\*) A. DE LA SALLE has recorded (*Relation du Voyage 3* : 257-289) that "La Bonite" visited Tourane from Jan. 24 to Feb. 4, 1837.

specimens (e.g. *Pandanus Loureirii* Gaud.) marked "Annam, Tourane; Gaudichaud". During his stay in Vietnam from 1959-1961, Dr. ST. JOHN saw *Freycinetia* in only one place. This was at the Col de Blao, at the head of Da Mre Stream, 1 175 m alt., about 3/5 of the way from Saigon to Dalat. There in dense virgin forest with trees about 30 m tall, were several vines of *Freycinetia*, climbing high on the trees. At intervals during a period of more than two years, this colony was inspected, but no flowers or fruits were seen. The species may have been either *F. Webbiana* or *F. sumatrana*. It is very likely that the original collection of *F. Webbiana*, which was never located by WARBURG or MARTELLI, was obtained at this very locality.

RELATIONSHIP : The closest species appears to be *Freycinetia pycnophylla* Solms, an endemic species in Ceylon. The Malaysian *F. imbricata* Bl. may also be a rather near relative. If this is so, then *F. Webbiana* may belong in Sect. *Sarawakensia* B. C. Stone.

## 2. FREYCINETIA SUMATRANA IN CAMBODIA AND VEITNAM (Pl. 2, fig. 2)

MARTELLI has already reported the presence of the genus *Freycinetia* in Indo-China (in LECOMTE, Fl. Gen. de l'Indo-Chine, 6, 8 : 1068). MARTELLI states : « Quelques représentants du genre se rencontrent dans l'Indo-Chine, mais certainement c'est un genre qui est très pauvrement représenté dans cette région. J'ai vu seulement un échantillon sans fleurs et sans fruits et par conséquent indéterminable, récolté par L. PIERRE dans les montagnes de Baria et sur le Mont Schral dans le Cambodge ».

These PIERRE specimens have been examined (on loan from the Martelli Herbarium, Istituto Botanico, Università di Firenze) through the kindness of Dr. Guido Moggi. They are conspecific with a specimen received from Paris, accompanying the *Poitane* specimen above referred to *E. Webbiana*, which was collected in Cambodia by M. Schmid. Although all these specimens are sterile, the highly characteristic foliar characters, especially the lobed and denticulate auricles, allow a confident determination of this species as *Freycinetia sumatrana* Hemsl., which is therefore a new record for Cambodia.

### *Freycinetia sumatrana* Hemsley

Kew Bulletin : 167 (1896). *F.* sp. Ignot.; MARTELLI, in LECOMTE, Fl. Gen. de l'Indo-Chine, 6, 8 : 1068-9 (1937).

CAMBODIA : In monte Schral, Sept. 1870, L. Pierre 6637 (F1!). Deum chek bei Chuor, Koulin (?), M. Schmid s.n. (P!). (Sterile). — VIETNAM : Ad montem Dinh in pref. Baria, \* Aug. 1866, L. Pierre 6636 (F1!).

This species of Sect. *Auriculifoliae* B. C. Stone was first described from Sumatran material. For many years, its existence outside Sumatra

(\*) This locality is in foothills east of Saigon, in South Vietnam.

was obscured by later synonyms used for it in other localities (in Malaya, it was called *F. valida* Ridl.; in the Philippines, *F. auriculata* Merr.; in the Andaman Islands, *F. insignis* sensu Kurz (non Blume). The species has recently been reported in Thailand (STONE, in press). Thus the total range of *F. sumatrana* extends from the Andaman and Nicobar Islands to Sumatra, the Malay Peninsula, Thailand, Cambodia, Borneo, and the south-west Philippines (Palawan and Basilan Islands). The Cambodian and Vietnamese specimens here reported fit well into the geographic pattern already established. The species may yet be found in Laos.